

## **REMARKS**

Applicants have amended claims 1, 14, 21 and 22 to clarify that in the “growth enhancing amount” of DHA and ARA enhances the physical growth of preterm infants. This limitation is supported in the specification at page 4, lines 13 – 32 and page 23, lines 7 – 13, where preterm infants are discussed relative to their physical “weight” gain.

- I. **Rejection of claims 1-5, 14-17, and 21-22 under 35 U.S.C. §103 as obvious over U.S. Patent No. 5,374,657 to Kyle in view of Crozier, G.L., et al., (Monatschrift Fur Kinderheilkunde, Vol. 143, No. 7, 1995, page 95-98) and Schweikhardt, et al.**

The Examiner rejected claims 1-5, 14-17, and 21-22 under 35 U.S.C. § 103(a) as being obvious over Kyle in view of Crozier and Schweikhardt. The Examiner asserted that Kyle teaches an infant formula comprising DHA and ARA and that the presence of those two fatty acids in infant food is critical for the “healthy growth” of the infants. Admitting that Kyle does not teach the administration of that infant formula to preterm infants, the Examiner then asserted that Crozier, *et al.* teach that “the presence of ARA and DHA in food is particularly important for the proper growth and development of preterm infants because they are unable to synthesize sufficient ARA and DHA.” The Examiner also admitted that while both of Kyle and Crozier fail to teach or suggest the amounts of ARA and DHA now claimed, Schweikhardt discloses such amounts. Thus, the Examiner concluded that it would have been *prima facie* obvious to a person of ordinary skill in the art, at the time the claimed invention was made, to administer the infant formula of Kyle to the preterm infants of Crozier in the amounts suggested by Schweikhardt.

Even if one of ordinary skill in the art were to combine Kyle, Crozier and Schweikhardt, a combination that Applicants contend is not suggested by the prior art,

the combination would still not teach or suggest every one of the limitations in the amended claims of the present application. See MPEP § 2142 - § 2143 (explaining that the prior art references, when combined, must teach or suggest all the claim limitations); and see In re Royka, 180 USPQ 580 (CCPA 1974) (“all words in a claim must be considered in judging the patentability of that claim against the prior art”). Specifically, the combination of Kyle, Crozier and Schweikhardt does not teach or suggest a method for enhancing the physical growth of preterm infants by administering to the preterm infants a physical growth enhancing amount of DHA and ARA as required by amended claim 1 of the Application.

The Examiner states that Kyle teaches that the presence of DHA and ARA in infant food is critical for the “healthy growth” of infants. Likewise, the Examiner states that Crozier teaches that the presence of ARA and DHA in food is particularly important for the “proper growth and development” of preterm infants because they are unable to synthesize sufficient ARA and DHA.

However, Crozier only teaches “proper growth and development” in terms of nerve tissue. On page 96, column 3, lines 1-22, Crozier explains:

Both docosahexaenoic and arachidonic acids are important in brain growth. Brain tissue is 60% lipid and its fatty acid composition is surprisingly constant: the predominant acids are AA [ARA] and DHA.

On page 97, column 2, lines 1-21, Crozier discusses the apparent effect of these fatty acids on visual function and brain development:

Breast feeding has an effect on maturation of visual acuity. Measures of visual evoked potential and forced-choice preferential looking were significantly different in infants fed breast milk compared to those fed formula. Measures of intellectual development have also been demonstrably different between breast and formula fed preterm infants.

Morley et al showed that preterm infants who had been given breast milk had better developmental scores at the age of 18 months. This advantage continued: at 7.5 to 8 years of age, the breast-fed group scored significantly higher intelligence quotients as demonstrated by the Weschler Intelligence Scale for Children.

These quoted paragraphs clearly show that for Crozier, “proper growth and development of the preterm infants” means “proper growth of the nervous system and mental development of the preterm infant.” Preterm infants’ proper brain growth, accelerated maturation of visual acuity, and improved intellectual development are the benefits that Crozier seeks in promoting the addition of DHA and ARA to preterm infants’ formula. Crozier simply does not teach or suggest enhancing the physical growth of preterm infants by administering to them a formula containing a physical growth-enhancing amount of DHA and ARA.

In contrast to the teachings of Crozier, Applicants’ have unexpectedly discovered that adding DHA and ARA in the amounts of claim 1 to an infant formula not only cancels the drop in weight gain reported by Carlson, but also enhances the weight gain of preterm infants. Applicants’ methods enhance the weight gain of preterm infants to such an extent that preterm infants receiving DHA-and ARA-supplemented formula during their one-month hospitalization after premature birth and who are then switched to regular term infant formula without DHA or ARA after discharge from the hospital have, after 57 weeks from conception, approximately the same weight as term infants continuously breast-fed since birth. Therefore, by feeding preterm infants formula with the amounts of DHA and ARA described in claim 1, there is an unexpected enhancement in physical weight gain over infants fed formulas lacking these two fatty acids.

This unexpected discovery is illustrated by the data presented in the Applicants' specification. Table 3 (page 28) shows the mean weight gains for preterm infants, with weight gains of 30.7 grams/day (g/d) for the Control group and 34.7 g/d for the DHA+ARA group. Table 5 also clearly demonstrates a significant difference in weight gain between the control and DHA+ARA fed groups. This is also illustrated in Figure 1, which is a graphical representation of the weight gain results between the DHA+ARA and Control groups. Further, at page 23, lines 7-13 of the Application, Applicants report the results as follows:

Post-hoc analysis reveals that infants on DA [DHA & ARA-enhanced formula] grew faster than infants receiving C [regular formula] and D [DHA-enhanced formula] (See table 5 and figure 1). This enhanced growth provided faster "premature infant catch-up" compared to C and D. Weight achieved by the DA group (3198 g) was higher than C (3075 g) and D (3051 g) at 40 weeks post-conceptual age but had not fully caught up to the term weight (3438 g) of group H [breast-fed term infants] (See table 4 and figure 2). This catch up trend continued through 48 to 57 weeks by which time the mean weight of group DA did not differ from group H while groups C and D remained significantly lower. (Emphasis added).

These surprising results, completely unexpected and contrary to the teachings in Crozier clearly show that the claimed method enhances the preterm infant's physical growth beyond levels achievable with formulas not supplemented with both DHA and ARA at the claimed physical growth-enhancing amounts. Therefore, even if one were to combine the teachings of Kyle, Crozier and Schweikhardt, the combination would still not teach or suggest the limitations of enhancing the physical growth of preterm infants in claim 1 of the present application.

Not only does Crozier fail to teach or suggest enhancing the growth of preterm infants or that it is even possible by feeding preterm infants DHA and ARA, Crozier in fact, teaches away from enhanced growth. For example, Crozier cites a study by Carlson, *et al.* in which preterm infants given supplemental DHA actually demonstrated a decrease in weight gain. Crozier teaches away from enhancing the physical growth of preterm infants by suggesting that the addition of ARA be made for purposes other than for compensating for the drop in weight gain caused by DHA in the Carlson study (e.g., the suggestion that ARA improves nerve tissue development). Therefore, the combined teachings of Kyle, Crozier and Schweikhardt, taken as a whole (*i.e.*, that DHA causes a decrease in growth in preterm infants), would lead one of ordinary skill in the art away from enhancing the physical growth of preterm infants. As a result, the claimed method is patentably distinct over the combination of Kyle, Crozier and Schweikhardt.

Such a teaching away by Crozier must be considered by the Examiner as evidence of non-obviousness because a prior art reference must be considered in its entirety, *i.e.*, as a whole, including portions that would lead away from Applicant's claimed invention. See W.L. Gore & Associates, Inc. v. Garlock, Inc., 220 USPQ 303 (Fed. Cir. 1983). Specifically, the requirement of enhancing the growth occurs not only in the preamble of Applicants' claim 1, but also in its body, which now recites a physical growth enhancing amount of DHA and ARA. Applicants respectfully submit that these terms must be given patentable weight and that, by doing so, the claimed method is patentably distinct over the combination of references cited by the Examiner.

In summary, in view of the foregoing arguments and amendments, we respectfully submit that claims 1-5, 14-17, and 21-22 are patentably distinct over the references cited by the Examiner and meet all other statutory requirements. We believe that the present Application is now in complete condition for allowance and, therefore, respectfully request the Examiner to reconsider the rejections in the Office Action and allow this Application. We invite the Examiner to telephone the undersigned should any issues remain after the consideration of this response.

Please charge any additional fees that may be required to Deposit Account No. 50-2548.

Respectfully requested,

NELSON MULLINS RILEY & SCARBOROUGH

July 16, 2004  
Date

  
Robert S. Thomas  
Registration No. 52,284  
Keenan Building, Third Floor  
1330 Lady Street  
Columbia, SC 29201  
Phone: (864) 250-2298  
Fax: (803) 256-7500